1985-86
Sask. Agricultural Research Fund Grants
Project Summaries

1. Cereal Crops

Biology and Control of the Wheat Blossom Midge in Saskatchewan

J.F. Doane
Saskatoon Research Station
Agriculture Canada

Project Objectives:

1. To determine the species complex of potential carabid (ground beetles) predators of wheat midge, identify and quantify the most important species and map their seasonal distribution in relation to wheat midge activity.

2. To determine the effect of insecticides on the dominant species of carabids so that if practical, those that give the best midge control, but have least impact on predators, may be selected.

3. To determine by serological tests which beetles feed on wheat midge larvae in the field.

Potential Impact:

As well as developing efficient chemical controls for wheat midge we need to determine biological agents (parasites and predators) that act to reduce midge populations. Although insecticides will be necessary for control during severe infestations, ultimately natural parasites and predators may be the most useful agents in keeping the midge in check. Therefore, it is important to identify what insects are parasites and predators of wheat midge, and how insecticides affect them so that, as far as possible, insecticides and natural control agents may be used in an integrated control approach. This could result in substantial savings for Saskatchewan farmers if preservation of natural control agents could be augmented by judicious use of insecticides.

The Effect of Growth Regulators on Winter Survival, Lodging and Yield of Norstar Winter Wheat and Musketeer Fall Rye

L.V. Gusta
Crop Development Centre
University of Saskatchewan

Project Objectives:

1. To determine the effect of growth regulators on the lodging resistance of winter cereals.

2. To determine the effect of growth regulators on yield

3. To determine the effect of growth regulators on winter survival.

Potential Impact:

It has now been established that winter wheat can be successfully grown in Saskatchewan using the proper management techniques. Both winter wheat and rye respond profitably to higher levels of nitrogen than do spring crops. However, in the northern part of the province, which is generally wet in the spring, high rates of nitrogen result in excessive growth. Fields of rye six feet high are not uncommon. The excessive growth results in lodging, diseases, poor water use and large amounts of straw. These result in harvest losses to the farmer and can result in harvesting costs being three times normal. Growth regulators such as CCC, cerone have been used in Europe for many years to reduce plant height, reduce lodging and increase yields. Research is needed in Saskatchewan to determine if growth regulators can be used on a commercial basis to increase yields, reduce lodging and increase water use efficiency.

Target Penetration of Aerially Applied Insecticide Spray for Wheat Midge Control

K. Yoshida
Saskatchewan Research Council
Saskatoon, Saskatchewan

Project Objectives:

1. To study how spray droplets of insecticides deposit on intended target surfaces using field trials

2. To produce scientific data that assists pest control field specialists to make recommendations on best-suited control strategies and most efficient method of spray application.

Potential Impact:

A field spray trial was conducted in the summer of 1984 in the north-eastern part of the province where heavy infestations of wheat midge was reported. A best strategy for midge control must be established urgently, and be related to their life cycle and insecticide susceptibility. At present, the efficacy of insecticides on controlling midge in each growth stage is practically unknown. The study will produce realistic data for best utilization of insecticides and minimization of application cost.

2. Special Crops

Canola Press Cake as a High Energy, High Protein Animal Feed

J.M. Bell
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To determine the nutrient content and variability typical of press cake.
2. To determine the glucosinolate content and myrosinase activity typical of press cake.
3. To compare the above characteristics with corresponding seed and meal.
4. To estimate the feeding value and economic value of press cake in relation to alternative sources of energy and protein.

Potential Impact:

Currently available means of acquiring and incorporating fats or oils into feeds are not very satisfactory. Importation of cottonseed for this purpose by dairymen suggests that the need is great and that costs are justified. If this work reflects favorably on press cake we may have a new, domestic feed ingredient that can fill a small but important market in swine and dairy cattle feeding and the product may also prove of interest to poultry producers as well.

Scentless Chamomile Control Program

G. Bowes
Regina Research Station
Agriculture Canada

Project Objectives:

1. To control scentless chamomile in wheat and on a non-cropland area with herbicides.

2. To identify those herbicides which prevent seed production.

3. To measure the ability of scentless chamomile to compete with tame forage species.

4. To identity the habitats where scentless chamomile can persist.

5. To identify the major insect pests on scentless chamomile.

Potential Impact:

The potential impact of this project is the development of a control program for scentless chamomile. Control in most habitats is possible. The development of a control program is needed because (1) no information is available for the control of scentless chamomile during normal and moist years (2) a complete control program is not yet available and (3) it is important to develop control programs for localized weeds to prevent their spread.

Although 1984 was a very dry year, the experiments to control scentless chamomile were very successful. Several herbicides controlled scentless chamomile in wheat and in a non-cropland area. These experiments must be repeated in 1985 before we can be sure of the success of the herbicide treatments. The weed survey must be continued to identify all of the habitats where scentless chamomile can persist. A new experiment is required to test the ability of forage grasses to compete with the weed in non-crop areas. These experiments will provide a control program for scentless chamomile in cropland and in it's most preferred habitat.

Development of a Bleaching Resistant, Green Cotyledon Dry Pea for Saskatchewan

A.E. Slinkard
Crop Development Centre
University of Saskatchewan

Project Objectives:

1. To develop a bleaching resistant, green cotyledon dry pea cultivar adapted to Saskatchewan.

Potential Impact:

The development of a bleaching resistant, green cotyledon dry pea adapted to Saskatchewan will provide another "new" crop to Saskatchewan. Markets are available for up to 10,000 ha, providing a potential farm value in excess of $2 million per year. Suitable material is available from a student thesis and only needs to be evaluated for yield, disease resistance and cooking quality.

A Re-evaluation of Seed Treatments for Pulse Crops

R.A.A. Morrall
Department of Biology
University of Saskatchewan

Project Objectives:

1. To reassess the value of fungicidal seed treatments currently used on field peas in western Canada and assess the potential benefit of new compounds.

2. To resolve conflicting data on the benefit of seed treatment of lentils and find a means of improving emergence.

3. To test new fungicides as seed treatments for faba beans.

Potential Impact:

Since pulse seeds are large, planting costs are high and wastage should be minimized. Fungicides now purchased to use on field peas may have no beneficial effect. Although most data on

lentils suggest little or no beneficial effect of seed treatment, emergence of seed of high germinability is still typically only 60-65%. No evaluation of seed treatments of fababeans has been done in western Canada since the mid-1970's, yet several new fungicides have become available since then. Thus, positive results in this project could save growers money in several ways. This work is appropriate to Saskatchewan because half of the total pulse acreage in western Canada is found here. It is also noteworthy that periodic reviews of seed treatment chemicals for specialty crops are unlikely to be initiated by the chemical companies because the potential market for their products makes it a low priority for them.

3. Forage Crops

Fertilizer Requirements of Grazed Seeded Grass Pastures and the Effects on Nutrition and Production of Beef Cattle and Subsequent Performance on Winter Feed

R.D.H. Cohen
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To determine the biological and economic responses of grazed pasture to applications of nitrogen fertilizer.
2. To determine the effects of nitrogen fertilization of grazed pasture on the nutrition and production of beef cattle.
3. To determine the effect of nitrogen fertilizer on the efficiency of utilization of grazed pasture.

Potential Impact:

Grazed pastures in Saskatchewan are not utilized to maximum potential. Restrictions imposed by low soil nitrogen levels reduce pasture carrying capacities and nutritional value at a time when cattle nutrient requirements are greatest, i.e. during lactation, breeding and early growth of calves, heifers and steers. There is a paucity of information in the Province on the

biological and economic optimum level of nitrogen fertilizer application for maximization of primary and secondary productivity from grazed pasture. There is no information on the effect of climatic conditions and fertilizer on the nutritive quality of herbage consumed by grazing cattle (as opposed to herbage available) or the effect that advancing maturity has on the nutritive value of the herbage consumed. The relationships between these factors and animal nutrient requirements and status have not been reported for Saskatchewan pastures. The benefits include increased pasture productivity and utilization and improved animal nutrition and productivity.

Renovation of Pastures by Direct Seeding

J. Waddington
Swift Current Research Station
Agriculture Canada

Project Objectives:

1. To find an effective method of introducing alfalfa into native range land.

2. To compare a number of seed drills and renovation methods based on direct seeding techniques for introducing cultivated forage crops.

Potential Impact:

The recent drought in Saskatchewan has once again clearly demonstrated the urgent need for more productive pastures to maintain the livestock industry in the arid Palliser triangle. An effective method of introducing alfalfa and cultivated grasses without breaking up the pasture will reduce the loss of pasture from three or more years to one year, and will lead to increased production and a longer grazing season.

4. Horticultural Crops

Inhibitory Effects of Green Foxtail (Setaria viridis L.) on Onion Plants

D.H. Dabbs
Department of Horticultural Science
University of Saskatchewan

Project Objectives:

1. Attempt to determine if green foxtail plants exude a toxin (as is suspected) that exerts an inhibitory effect on developing onion plants.

2. If such a toxin is present, determine at what stage in the life span of the green foxtail plant it first becomes evident.

3. Continue the search for a safe herbicide that will prevent green foxtail plants from becoming established in an onion field.

Potential Impact:

One of the major limiting factors to an increased level of onion production in Saskatchewan has been the uncertainty of obtaining an adequate level of weed control. For many years Saskatchewan growers have only produced about one percent of the onions consumed within the province. Largely as a result of weed control research this situation is improving, but more research is required, especially regarding the extremely deleterious effect of only a relatively small population of green foxtail.

It is strongly felt by this Department that a more complete understanding of these deleterious effects of green foxtail is a necessary part of ongoing research aimed at encouraging an increased production of onions in Saskatchewan.

Using Etiolation as a Pre-treatment in the Propagation of Saskatoon Softwood

S.H. Nelson
Department of Horticulture Science
University of Saskatchewan

Project Objectives:

1. To improve the rootings on Saskatoon cuttings.

Potential Impact:

The nursery industry and fruit growers are very interested in the Saskatoon as a native fruit crop that could be produced commercially. It is a shy rooter from cuttings producing a very few long straggly roots - at least one of the problems associated with its successful transplanting.

Because of the propagation problem, Saskatchewan nurserymen have not been able to respond to the interest and demand in sufficient quantity of plants. A few commercial plantings in Alberta have demonstrated the acceptability of the product and there is considerable interest in Saskatchewan. During the year a plantation was established just south of Saskatoon.

Vegetable Varietal Trial
Prairie Produce Limited
Outlook

Project Objectives:

1. To determine the varieties of vegetables best suited to commercial production in Saskatchewan in terms of yield and quality.

Potential Impact:

Other than potatoes, Saskatchewan only produces about 10% of its "in season" vegetable requirements. Saskatchewan consumers spend in the neighbourhood of $10 - 12 million for imported produce which can and should be grown in Saskatchewan.

5. Ruminants

Study of a Bleeding Disorder in Simmental Cattle

G.P. Searcy
Western College of Veterinary Medicine
University of Saskatchewan

Project Objectives:

1. To determine the incidence of a platelet function defect responsible for a bleeding disorder in Simmental cattle.

2. To determine the mode of inheritance of the platelet function defect in Simmental cattle.

Potential Impact:

A prolonged bleeding disorder of Simmental cattle has been recognized in Western Canada since 1972 and since 1980 several of these animals have been presented to the Western College of Veterinary Medicine. It is now apparent that the problem be pursued in order to:

(1) Eliminate this disorder from the Simmental breed of cattle

(2) Provide the basis for future in-depth study of the defect within the platelets.

Intensification of Sheep Production Under Prairie Conditions

N.C. Rawlings
Western College of Veterinary Medicine
University of Saskatchewan

Project Objectives:

1. To apply techniques for reproductive management in a scheme for intensifying fat lamb production under commercial conditions.

2. To work toward 3 basic goals: a) increasing ewe fertility; b) producing 3 lamb crops in 2 years and c) spreading the supply of finished lamb across the year.

3. To investigate the a) long term efficacy of repeated controlled breeding with day length manipulation; b) managerial, flock health and nutritional requirements; c) suitability and longevity of different breed types; d) economics of the scheme in contrast to traditional sheep production; e) usefulness of various forms of pregnancy diagnosis, induced lambing AI; and f) new techniques and approaches for reproductive management in the ewe.

Potential Impact:

There is an unfilled market for fresh lamb in Canada and of the lamb consumed, 70% is imported. Developing and satisfying this market is hampered by the lack of organized marketing, poor productivity and the seasonability of production. Sheep production in the prairies is small, non-intensive and traditional, often secondary to other enterprises. Little new technology has permeated the industry. However, many producers

are interested in increased productivity and sheep production as a single enterprise. Like hog and poultry production 25 years ago, with new technology, sheep production has all the potential to be intensified and very profitable. The technology now exists to improve productivity and remove seasonal constraints. Sheep are well suited to the Saskatchewan climate and can utilize surplus local feeds. With the present buoyancy in the industry, intensified sheep production could play a valuable role in diversifying food production, reducing imports and providing alternative farming opportunities.

Evaluation of Protein Status of Lactating Dairy Cows

D.A. Christensen
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To evaluate a method for determining the adequacy of dietary protein in the rations of high producing lactating dairy cows in early lactation.

2. To evaluate milk urea content as an index of the adequacy of dietary protein. As many proteins used in dairy rations are rapidly degraded in the rumen and lost to the animal through the urine, it may not be sufficient to simply provide the amount of protein called for in requirement standards.

Potential Impact:

The benefit of this research would be to provide dairy farmers, the feed industry, the milk analysis lab and the feed testing service with a reliable index of the adequacy of dietary protein level in the rations of dairy cows. The benefits of this research would be two-fold. The first benefit would be to dairy farmers through providing them with information on the adequacy of protein levels in their rations and a basis for adjusting the dietary protein to ensure maximum milk production. The second benefit would be through avoiding over supplementation and the cost of supplying more than the necessary amount of protein in dairy rations.

To Evaluate Practical Postpartum Nutritional and Drug Management on Controlled Breeding of Beef Cows

D. McCartney and A. Robertson
Melfort Research Station
Agriculture Canada

Project Objectives:

1. To evaluate the interrelationship between postpartum nutritional levels in beef cows and the use of hormones and prostaglandins to regulate estrus in controlling the breeding season.

Potential Impact:

The Melfort Research Station, in co-operation with Saskatchewan Agriculture Lands Branch and Horned Cattle Fund, is conducting research on beef cow-calf and pasture management systems. We presently have a herd of 300 crossbred cows divided into two equal groups, one of which calves in January-February and the other during March and April. Nutrient requirements of two crossbred lines (Simmental x Hereford and Angus x Hereford) are being evaluated by measuring all feed consumed and recording animal weights several times throughout the winter. Thus, this herd would provide an excellent opportunity to evaluate this system of reducing time to first estrus following calving. To date experiments on this subject have only been carried out on a limited basis with no reference to nutritional background. Eventually this method could be used in Saskatchewan private and community pastures to concentrate the breeding season into a shorter time period resulting in a more uniform calf crop.

Electronic Identification of Livestock

G.C. Zoerb and J.W. McLean
Agricultural Engineering Department
University of Saskatchewan

Project Objectives:

1. To help advance electronic identification in cattle for the following purposes: proof of ownership; disease control; herd management aspects; regulatory and law enforcement.

2. To develop a system that would be of computer-compatible format based on an existing or modified commercially available model specifically applying the rumen implant method. The system would be easily integrated into present practices used by the rancher, stockman, and health and regulatory bodies.

Potential Impact:

Electronic identification of livestock has reached the commercial stage due to advances in computer and chip technology. But investigation is required to decide what system would be best for Saskatchewan and possibly Canada now and in the future. Development of a system, possibly the rumen implant method, would provide: positive identification of ownership at the market place, increased security against rustling, better record keeping of performance for herd management. In addition, the development of a reliable electronic identification system would allow the phasing out of the brand. Besides damage to the hide, branding presents other problems, particularly for the small rancher. The above benefits would have an economic ripple effect throughout the Saskatchewan livestock industry.

6. Non-Ruminants

Dietary Enzyme Supplementation as a Method of Improving the Nutritional Value of Cereal Grains

H.L. Classen
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To study the practical use of dietary enzymes in improving the nutritional value of cereal grains.

2. To study the effects of dietary enzyme supplementation in chicken broiler and turkey diets.

Potential Impact:

The major benefits are the potential reduction in feed costs as a result of the use of cheaper feed grains and improvement in

poultry productivity. These factors would act to improve the competitive advantage of Saskatchewan poultry producers. In the past, Saskatchewan producers have had to pay higher feed costs than their eastern Canada counterparts. This, despite the fact that Saskatchewan is a major site of grain production. Difficulty in obtaining feed wheat and generally high prices have influenced this problem and use of increased amounts of barley should have a marked effect on poultry production costs. Information on the utilization of cereal grains such as hulless and hulled barley in poultry diets may improve their export market potential because sales for poultry feed represent an important component of the feed grain market.

Effects of Combinations of Feed Quantity, Feed Quality and Low Air Temperatures on Post Weaning Diarrhea in Pigs

G.I. Christison
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To improve weaning management by examining how three important causes of non-infectious diarrhea interact with one another.

2. To determine the importance of the malabsorption of nutrients as a cause on non-infectious diarrhea.

3. To determine how feed quantity and quality, water quality and low air temperatures affect the susceptibility of weanling pigs to a standard challenge with diarrhea-producing bacteria.

Potential Impact:

Diarrhea of newly weaned pigs is a continuing problem for the swine industry. Losses are those of morbidity and mortality plus those caused by short and long-term reductions in productivity following outbreaks of diarrhea. There is a surprising lack of good information available about how different weaning practices can or should be combined.

Abnormal Behaviour in Early Weaned Piglets

N.J. Lewis
Department of Animal and Poultry Science
University of Saskatchewan

Project Objectives:

1. To determine the extent to which ear biting, tail biting, and belly-nosing effect production.

2. To study the initiation of ear-biting, tail-biting and belly-nosing as a means of determining its cause and prevention.

Potential Impact:

The research program will concentrate on abnormal behaviour caused by intensification, specifically tail-biting, ear-biting and belly-nosing. These vices are costly both because the victims are stressed and because the present method of preventing the behaviour is costly. For example, to prevent tail-biting in a 250 sow herd 4,000 pigs/year are tail docked. Assuming 1 min. of work for each tail at $5.00/hour this is $333.00/year and the piglets are still being stressed, firstly by the tail docking and later by the subclinical effects of tail-biting because the vice hasn't really been stopped.

Swine Barn Ventilation

E. M. Barber
Agricultural Engineering Dept.
University of Saskatchewan

Project Objectives:

1. To evaluate air distribution and pen microclimate with alternative inlet and air recirculation systems.

2. To develop and evaluate an electronic air inlet controller.

3. To complete data collection and analysis begun in 1984-85 project and hence to test the hypotheses as outlined in the original project proposal.

Potential Impact:

The ability to evaluate and control the microclimate within livestock barns is critical to the continued competitiveness of cold-climate livestock production in Saskatchewan. The full benefit to livestock producers of the Saskatchewan Program to supply natural gas to farmers will be realized only if

centralized preheat systems can be designed and tested. The use of centralized heating systems and air recirculation systems, and the increasing availability of electronic controllers hold promise but, at present, farmers are reluctant to adopt these largely untested concepts and equipment. Both the farmers, and Saskatchewan Industry that will make and sell the new technology, will benefit from the proposed research.

7. Land, Air, Water

Groundwater Irrigation

J. A. Gillies
Agricultural Engineering Dept.
University of Saskatchewan

Project Objectives:

1. To assess the impacts on the physical characteristics of the source aquifer due to an irrigation pumping demand.
2. To monitor the distribution and evaluate the transport mechanism of soluble salts within the soil profile.
3. To assess the variation of water quality in the source and surficial aquifers in areas where groundwater irrigation is practised and relate to the potential for changes in the quality of domestic supplies developed from shallow aquifers.
4. To monitor crop production and relate to the changing soil salinity status.

Potential Impact:

Should irrigation with groundwater become a widespread practice, the potential widespread impacts may be significant. Generally in Saskatchewan the only aquifers capable of sustaining an irrigation demand, yield water of very poor quality. Consequently, potential impacts from such irrigation projects may be: soil salinization; surficial and shallow groundwater contamination; and source aquifer deformation. There is evidence that poor quality groundwater can be used successfully for irrigation, however caution has been advised until appropriate research extension information has been developed.

The Determination of s-triazine Levels in Soil by Instrumental Analysis and Bioassay

R. B. McKercher
Soil Science Dept.
University of Saskatchewan

Project Objectives:

1. To determine whether the inexpensive bioassay procedure for s-triazine pesticides determines the total soil content of the chemical or whether the more expensive instrumental analyses by gas-liquid chromatography is necessary to determine the true soil content.

2. To elucidate on the nature of soil binding of these herbicides.

Potential Impact:

The impetus behind the project is on the one hand to prepare data and information respecting how it would be most efficient for testing and advisory laboratories to carry out analyses for herbicide chemical residues. The demand for residue information is steadily rising but aside from the method of analysis is the necessity to interpret the analytical results. A secondary objective is to train people in advanced analytical skills and interpretation of results. The demands for such skills and this type of information are already present.

Minerology, Morphology and Dynamics of Salts in Agricultural Soils of Saskatchewan

A. R. Mermut
Soil Science Dept.
University of Saskatchewan

Project Objectives:

1. To identity mineral species in salt crusts, in saline soil layers, and is geological columns.

2. To establish major soluble mineral associations in Saskatchewan soils.

3. To investigate the origin of salts and their significance in relation to salt loading groundwater and/or aquifers.

4. To provide basic information for the reclamation of saline soils in the province.

Potential Impact:

Soil salinity is recognized as one of the major problems threatening the productivity of farmland in Saskatchewan. Recently, the Saskatchewan Institute of Pedology has initiated a large research program which includes field investigation, drilling and sampling programs, field and laboratory measurements for diagnosis and installation of hydrological instrumentation to monitor water flow, and hence salinization. This particular program will continue for another three years, and promises to provide definite answers to soil salinity problems in Saskatchewan. Because of its complex nature, very little is known about the mineralogical composition of soluble salts in Saskatchewan; especially the morphology, microscopy and submicroscopy of salts have never been studied. As it is apparent from recent studies elsewhere, it becomes very evident that the morphology and solubility of the various crystalline phases in multi-component salt systems are of great importance in understanding the formation, source, and fate of salinity. It is clear from the foregoing that the proposed research should be carried out within the coming three years to benefit fully from the ongoing research project initiated by our department.

Use of Leonardite for Soil Improvement

A. Abouguendia
Saskatchewan Research Council
Saskatoon

Project Objectives:

1. To study the effect of leonardite on the emergence, establishment and growth of forage plants under field conditions.

Potential Impact:

Leonardite has a potential as a soil amendment in view of the increase in the area of salt affected land and in view of the substantial decline in soil organic matter and nutrients content in the grainbelt of the province.

8. Energy, Equipment

Comparative Efficiency of New Low Volume Applicators for Use With Herbicides

R. Ashford
Dept. of Crop Science and Plant Ecology
University of Saskatchewan

Project Objectives:

1. To demonstrate whether or not the improved spinning-disc nozzles being marketed at present will give results comparable to the best hydraulic nozzles for application of herbicides to wheat grown under field conditions.

Potential Impact:

Recent improvements in the manufacture and operating procedures for the spinning-disc nozzle have greatly increased its potential as a major tool for application of herbicides. Major potential benefits include: (1) Reductions in the amount of water required per acre from 10 gallons down to 2 gallons; (2) Potential for increased efficacy (lower herbicide costs) and (3) Reduction in amount of drift. Unfortunately, little, if any work is being done on the efficacy of these new nozzles under western Canadian conditions.

9. Socio-Economics

The Comparative Advantage of Wheat Production in Saskatchewan

W. H. Furtan
Dept. of Agricultural Economics
University of Saskatchewan

Project Objectives:

1. To develop a framework in which the full cost of wheat production and economic returns can be measured;

2. To collect the data from Saskatchewan farms and other sources to get a measure of the full cost and returns to wheat production in Saskatchewan;

3. To compare the results found in this study with similar analysis of U.S., Australia, E.C. and U.S.S.R. wheat production;

4. To develop some projections as to our comparative advantage with our competitors in the wheat market and thus the potential income of Saskatchewan farmers.

Potential Impact:

This research would have two potential impacts. Firstly, farmers are receiving a low price for their wheat. It is likely the price received does not cover the full cost of production when costs include soil depletion, etc. This study would document this condition and thus would be useful information for farmers to have when they put their case to governments.

Secondly, this information would be useful for government agencies when they evaluate such programs as W.G.S.A. This could also be seen as supporting information for farm groups when attempting to get support levels in line with costs and returns. This is especially true when considering that our farmers must remain competitive in world markets.

10. Miscellaneous

High Temperature Fermentation of Straw

D. E. Caldwell
Dept. of Applied Microbiology and Food Science
University of Saskatchewan

Project Objectives:

1. Bacteriological and biochemical description of isolates.

2. Optimization of conditions for saccharification of wheat, barley and flax straw.

3. Determination of hydrolysis rates and products.

Potential Impact:

Successful completion of the objectives will provide a new and more cost effective means of converting agricultural residues and non-crop plants to sugar and/or fermentation end products such as ethanol (gasoline additive) and butanol (diesel fuel additive). The process could potentially be carried out on the farm in a co-operative processing facility or industrially.

No bacteria have yet been isolated which are capable of fermenting cellulose at the distillation temperature for ethanol (78 C). Such organisms could substantially improve the economics of fermentation and create new markets for agricultural residues, such as flax straw, that cannot be returned to the soil or used as feed. In July of 1983 the investigator obtained enrichment cultures from geothermal environments capable of 78 C cellulose fermentation using microcrystalline cellulose. It is proposed that these organisms be isolated and applied to the fermentation of agricultural residues.